Claims

Sub A8

1. An adhesive film comprising:

(i) a substrate layer, which comprises a thermoplastic resin, and

(ii) an adhesive layer, which comprises an olefin copolymer, wherein the olefin copolymer comprises polymerization units of at least two olefins selected from the group consisting of ethylene and $\alpha$-olefins having 3 to 20 carbon atoms, and the olefin copolymer satisfies the requirements:

(a) the olefin copolymer has neither a peak of crystal melting calorie of not less than 1 J/g, nor a peak of crystallization calorie of not less than 1 J/g in a differential scanning calorimetry according to JIS K 7122, and

(b) a molecular weight distribution of the olefin copolymer, Mw/Mn, is not more than 3.

2. The adhesive film according to Claim 1, wherein an intrinsic viscosity [$\eta$] of the olefin copolymer is from 0.5 to 10 dl/g.

3. The adhesive film according to Claim 1, wherein the olefin copolymer satisfies a requirement that an X defined by the following formula (1) is not less than 0.020, wherein

$$X = [A(T2M) - A(T2C)/[|(T2A - T2B)|] \qquad (1)$$

(1) T2A is a T2 relaxation time obtained from a pulse NMR measurement of one polypropylene resin selected from the group consisting of the following (A) to (C);

(2) T2B is a T2 relaxation time obtained from a pulse NMR measurement of the olefin copolymer;

(3) A(T2M) is a value obtained through a definite integration of a curve based on a third regression equation within a range of Pa = 0 ~ 1, wherein the curve is obtained in a manner such that respective T2 relaxation times of the olefin copolymer, the above-defined polypropylene resin and a resin composition comprising the olefin copolymer and said polypropylene resin are plotted on the ordinate, and a weight ratio (Pa) of the olefin copolymer in the resin composition is plotted on the abscissa; and

(4) A(T2C) is a value obtained through a definite integration of a curve based on a third regression equation within a range of Pa = 0 ~ 1, wherein the curve is obtained in a manner such that respective T2 relaxation times expressed by T2C (Pa), which is found from the following formula (2) using the T2A and T2B, are plotted on the ordinate, and a weight ratio (Pa) of the olefin copolymer in the resin composition is plotted on the abscissa:

(A) a propylene polymer, which has a melt flow rate of $12.0 \pm 3.0$ g/10 min. at 230℃ under a load of 2.16 kg, and which shows a main peak position (melting point) of $160 \pm 3$℃ in a

crystal melting measured according to JIS K 7121 using a differential scanning calorimeter (DSC), and shows a crystal melting calorie of 100 ± 5 J/g measured according to JIS K 7122 using a differential scanning calorimeter (DSC),

(B) a propylene-ethylene copolymer, which has a melt flow rate of 3.0 ± 0.5 g/10 min. at 230℃ under a load of 2.16 kg, and which shows a main peak position (melting point) of 145 ± 2℃ in a crystal melting measured according to JIS K 7121 using a differential scanning calorimeter (DSC), and shows a crystal melting calorie of 87 ± 5 J/g measured according to JIS K 7122 using a differential scanning calorimeter (DSC), and

(C) a propylene-ethylene copolymer, which has a melt flow rate of 1.0 ± 0.6 g/10 min. at 230℃ under a load of 2.16 kg, and which shows a main peak position (melting point) of 135 ± 2℃ in a crystal melting measured according to JIS K 7121 using a differential scanning calorimeter (DSC), and shows a crystal melting calorie of 60 ± 5 J/g measured according to JIS K 7122 using a differential scanning calorimeter (DSC),

$$T2C(Pa) = 1/[PvA(Pa)/T2A + (1 - PvA(Pa))/T2B] \quad (2)$$

wherein T2A and T2B are as defined above, and PvA(Pa) is a numerical value defined by the following formula (3), wherein

$$PvA(Pa) = VA \times (1 - Pa)/VC(Pa) \quad (3)$$

(1) VA is a volume ratio of components measured within a range of 70 ~ 150 $\mu$sec. in a free induction decay (FID) obtained from a pulse NMR measurement of the polypropylene resin; and

(2) VC (Pa) is a volume ratio of components measured within a range of 70 ~ 150 $\mu$sec. in a free induction decay (FID) obtained from a pulse NMR measurement of the resin compositions different in the composition.

4. The adhesive film according to Claim 3, wherein the olefin copolymer satisfies a requirement that the X defined by the formula (1) is not more than 0.040.

5. The adhesive film according to Claim 1, wherein the olefin copolymer satisfies a requirement that an elastic recovery (S) defined by the following formula (4) is from 70 to 100%,

$$\text{Elastic recovery } S(\%) = \text{stress-residual deformation recovery} \times 100 / \text{stretch deformation} \quad (4)$$

wherein the stress-residual deformation recovery and the stretch deformation are those obtained from a hysteresis curve of a resin composition comprising 70 parts by weight of the olefin copolymer and 30 parts by weight of one polypropylene resin selected from the group consisting of the following (B) and (C), provided that at least one resin composition satisfies the above-defined

requirement,

a differential scanning calorimeter (DSC),

(B) a propylene-ethylene copolymer, which has a melt flow rate of 3.0 ± 0.5 g/10 min. at 230℃ under a load of 2.16 kg, and which shows a main peak position (melting point) of 145 ± 2℃ in a crystal melting measured according to JIS K 7121 using a differential scanning calorimeter (DSC), and shows a crystal melting calorie of 87 ± 5 J/g measured according to JIS K 7122 using a differential scanning calorimeter (DSC), and

(C) a propylene-ethylene copolymer, which has a melt flow rate of 1.0 ± 0.6 g/10 min. at 230℃ under a load of 2.16 kg, and which shows a main peak position (melting point) of 135 ± 2℃ in a crystal melting measured according to JIS K 7121 using a differential scanning calorimeter (DSC), and shows a crystal melting calorie of 60 ± 5 J/g measured according to JIS K 7122 using a differential scanning calorimeter (DSC).

6. The adhesive film according to Claim 1, wherein the adhesive layer comprises the olefin copolymer and a thermoplastic resin.

7. The adhesive film according to Claim 1, wherein the adhesive layer comprises the olefin copolymer and a crystalline polyolefin resin.